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Philippines

Agricultural Biotechnology Annual

Philippine Biotechnology Situation and Outlook

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Report Highlights:
The Philippines remains a regional biotechnology leader and continues to be looked up to for guidance on biotechnology policy by other developing countries. Under the Philippines regulatory regime, 32 transformation events and 28 stacked-trait products have been approved for direct use as food, feed or for propagation. Genetically modified (GM) corn was planted on 27% (685,000 hectares) of the total Philippine corn area by an estimated 300,000 farmers in 2011. GM corn area and the number of farmers are likely to increase again in 2012 as the benefits and profits of GM technology become more apparent. There were no biotechnology-related trade disruptions in 2011. 2011 U.S. exports of GE products (e.g. soybean meal, feeds and fodders, etc.) to the Philippines grew by eight percent to reach $527 million. Commercialization of Bt eggplant is on track for 2013, and Golden Rice field tests are likely to be completed during the same year. Some international anti-GMO groups stepped up activities in the Philippines in 2011, including efforts to pass a mandatory GMO-labeling bill and block commercialization of Bt eggplant and Golden Rice. Some analysts attribute this intensified focus to fears that commercialization of GM products that bring clear consumer benefits could undermine their

efforts to ban GMOs in other markets.

Section I. Executive Summary:

The Philippine biotechnology regulatory system continues to remain science-based. Under the current regulatory regime as provided for by the Philippine Department of Agriculture's Administrative Order No. 8 (DA-AO 8)**,** 32 transformation events (TEs) and 28 stacked-trait products are approved for direct use as food, feed or for propagation. There are eight (8) biotech crop varieties approved for propagation while 17 field tests have been allowed since 2004.

The adoption by Filipino farmers of GM corn for propagation continues to be dramatic. From nearly 11,000 hectares in 2003, the area devoted to GM corn has increased to over 685,000 hectares in 2011. GM corn area harvested accounted for roughly 27 percent or over a 4^{th} of overall Philippine corn area. The increasing GM corn trend mirrors overall Philippine corn production which has consistently reached record-levels in recent years. Roughly 300,000 Filipino corn farmers now use GM corn varieties. Increasingly becoming more aware, farmers using conventional varieties are asking for greater access to GM corn seeds.

Guided by DA-AO 8, the first genetically modified (GM) crop being developed locally, the Fruit and Shoot Borer Resistant (FSBR) or *Bacillus thuringiensis* (Bt) eggplant, will likely be commercialized by 2013. Completed multi-location trials of Golden Rice are also expected by 2013.
U.S. agricultural exports to the Philippines with possible derivation from modern agricultural biotechnology continued to grow in 2011. U.S. exports to the Philippines increased more than 265 percent from $142 million in 2003 to $527 million in 2011. Soybean-based products from the U.S. accounted for the majority share (67 percent) of overall GM product exports in 2011, followed by feeds and fodder (17 percent).

Some international anti-GMO groups stepped up activities in the Philippines in 2011, including efforts to pass a mandatory GMO-labeling bill and block commercialization of Bt eggplant and Golden Rice. Some analysts attribute this intensified focus to fears that commercialization of GM products that bring clear consumer benefits could undermine their efforts to ban GMOs in other markets.

Section II. Plant Biotechnology Trade and Production:

As of June 7, 2012, there were eight (8) GM crop varieties approved for commercial production, unchanged from the previous year's level. This consisted of five (5) TEs and three (3) stacked or combined trait products (refer to Annex I and Annex II respectively). All the GM crop varieties approved for propagation were corn.

The promise of substantial yield improvements combined with the country's limited area of production has resulted in a significant adoption rate of GM corn in the Philippines. From nearly 11,000 hectares in 2003, the area devoted to GM corn dramatically increased to over 685,000 hectares in 2011, according to data from the Philippine Bureau of Plant Industry (BPI). GM corn accounted for roughly 27 percent or over a 4^{th} of all Philippine corn areas (2.5 million hectares) in 2011, compared to an estimated 22 percent share in 2010.

Corn: Philippine Production, Area Harvested & Yield 2003-2011				

	2003	2004	2005	2006	2007	2008	2009	2010	2011
National Prod'n (KMT)	4,615.,63	5,413.39	5,253.16	6,082.11	6,736.94	6,928.23	7,034.03	6,376.80	6,971.22
Total Area (KHas.)	2,409.83	2,527.14	2,441.79	2,570.67	2,648.32	2,661.02	2,683.89	2,499.04	2,544.61
Yield (MT/Has.)	1.92	2.14	2.15	2.37	2.54	2.60	2.62	2.55	2.74
GM Corn Area (KHas.)	10.769	59.756	50.009	127.873	313.895	347.575	327.226	542.522	685.372
% GM/Total Area (Has.)	0.45	2.36	2.05	4.97	11.85	13.06	12.19	21.71	26.93

Source: Bureau of Agricultural Statistics & Bureau of Plant Industry

About 70 percent of all GM corn planted in 2011 was located in the main island of Luzon, followed by Mindanao island with approximately a 27 percent share. Stacked trait GM corn varieties accounted for over 90 percent of all GM varieties in 2011. Making its debut in 2011 were pyramided corn varieties. Adequate rainfall in 2012 is likely to encourage more corn production and increased use of GM corn seed during the year. The following is a table on GM corn area for each island grouping from 2003 to 2011.

AGGREGATE DATA OF GM CORN 2003-2011 (Hectares)									
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
				Bt Corn					
LUZON	10,158	48,516	43,735	85,702	103,438	68,301	38,507	37,115	19,331
VISAYAS	24	534	445	405	2,551	298	0	0	0
MINDANAO	587	10,706	5,829	10,693	16,604	13,053	9,516	3,120	1,874
Total	**10,769**	**59,756**	**50,009**	**96,800**	**122,593**	**81,652**	**48,023**	**40,235**	**21,205**
				RR Corn					
LUZON	0	0	0	11,685	54,509	5,471	3,518	642	4,295
VISAYAS	0	0	0	4,424	8,925	4,571	2,790	0	800
MINDANAO	0	0	0	10,384	56,589	41,443	40,501	8,048	9,943
Total	**0**	**0**	**0**	**26,493**	**120,023**	**51,485**	**46,809**	**8,690**	**15,038**
				Stacked (Bt + RR)					
LUZON	0	0	0	3,879	59,346	158,520	183,771	373,079	452,730
VISAYAS	0	0	0	232	2,472	7,074	8,006	5,366	17,011
MINDANAO	0	0	0	469	9,461	48,844	40,618	115,153	173,924
Total	**0**	**0**	**0**	**4,580**	**71,279**	**214,438**	**232,395**	**493,598**	**643,665**
				Pyramided					
LUZON	0	0	0	0	0	0	0	0	4,537
VISAYAS	0	0	0	0	0	0	0	0	922
MINDANAO	0	0	0	0	0	0	0	0	5
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5,464**
GRAND TOTAL	**10,769**	**59,756**	**50,009**	**127,873**	**313,895**	**347,575**	**327,226**	**542,522**	**685,372**

*Bt –*Bacillus thuringiensis*
*RR – Roundup Ready

Source: Bureau of Plant Industry

Philippine corn farmers have benefitted from the use of GM corn. In a study on Bt corn by a local economist, it was found that Bt corn farmers earned 38 percent more than non-Bt corn farmers. The same study also reports that the cost of production was reduced by as much as P0.23/kilogram. Currently, there are roughly 300,000 GM corn farmers in the Philippines, considerably higher than the estimated 10,000 farmers in 2003.

The use of Bt corn reportedly has had no negative effect on insect populations in Bt corn fields (Reyes, 2004) and minimizes the use of harmful chemical insecticides/pesticides. Additionally, zero tillage technologies, such as in some GM corn varieties, helps conserve soil and water resources.

The latest list of regulated articles approved for field testing in the Philippines is provided in the following table. As of June 2012, there were 17 GM crop field trials approved, (i.e., 13 corn, 1 papaya, 1 cotton, 1 rice and 1 eggplant field tests), up from 13 recorded in the previous annual report.

APPROVAL REGISTRY FOR FIELD TESTING of REGULATED ARTICLES as of June 7, 2012		
Proposal	**Technology Developer**	**Date Approved**
1. Demonstration of Weed Control Performance of Roundup Ready Corn (RRC) System DK818 NK603 vis-à-vis Farmers' Practices	Monsanto	11/26/04
2. Performance of Roundup Herbicide (360 g ae/L IPA Salt) Against Weeds in Glyphosate-Tolerant Corn	Monsanto	11/26/04
3. Field Verification of the Agronomic Performance of the Transgenic Corn (*zea mays* L.) Hybrid Stacked (NK603/MON 810) Expressing the *Bacillus Thuringiensis* *Cry1AB* Protein for Resistance Against the Asiatic Corn Borer (*Ostrinia fumacalis Guenee*) and CP4 EPSPS for Tolerance Against the Herbicide Roundup	Monsanto	12/10/04
4. Performance of Heculex 1 Bt Transgenic Corn Hybrids against Asiatic Corn Borer (*Ostrinia fumacalis Guenee*) under field conditions in the Philippines	Dow Sciences	05/02/06
5. Field Testing of Transgenic Papaya with delayed Ripening Trait	University of the Philippines at Los Banos	03/20/07
6. Multi-location Field Efficacy Verification Trial of Herbicide Tolerant Maize Expressing Event GA21 Against Glyphosate Herbicide in the Philippines	Syngenta	11/19/07
7. Agronomic Equivalency Trial of MON89034 Hybrids with Regulatory Framework in the Philippines	Monsanto	08/01/08
8. Field Verification of the Agronomic Performance of Transgenic Corn (*Zea mays* L.) line MON89034 Expressing the *Bacillus thuringiensis* Cry1A.105 and Cry2Ab Proteins for Efficacy Against Lepidopterous Pests of Corn	Monsanto	08/01/08
9. Field Verification of the Agronomic Performance	Monsanto	08/01/08

of Stacked Hybrid Corn (*Zea mays* L.) MON89034		
x NK603 Expressing the *Bacillus Thuringiensis*		
Cry1A.105 and Cry2Ab2 Proteins for Efficacy against		
Lepitopterous Pests of Corn and CP4EPSPS for		
tolerance of Roundup Herbicide		
10. Multi-location Field Efficacy Trial of Corn Hybrid	Syngenta	10/28/09
Expressing the Stacked Trait Bt11 x GA21 Against		
the Asiatic Corn Borer and Glyphosate Herbicide in		
the Philippines		
11. Development and Commercialization of Philippine	University of the Philippines	3/16/2010 &
Fruit and Shoot Borer Resistant Eggplants Containing	at Los Banos	06/28/10
MAHYCO Bt eggplant event, EE-1. Multilocation		
Field Trials for Biosafety Assessment, Variety		Renewed to 3/15/13
Accreditation and Fertilizer and Pesticide Authority		& 06/2713
Registration		
12. Field verification of the Agronomic Performance of	Pioneer Hi-Bred	04/01/11
Transgenic corn (*Zea mays L.*) Line TC1507		
Expressing the *Bacillus thuringiensis* Proteins for		
Efficacy Against Asiatic Corn Borer and the PAT		
Proteins for tolerance to Glufosinate Herbicide.		
13. Field verification of the Agronomic Performance of	Pioneer Hi-Bred	04/19/11
Transgenic corn (*Zea mays L.*) Hybrid Stacked		
(TC1507 x MON810 x NK603) Expressing the *Bacillus*		
thuringiensis Proteins for Efficacy Against Asiatic		
Corn Borer and the PAT Proteins and CP4-EPSPS for		
tolerance to Glufosinate and Glyphosate Herbicides.		
14. Field Efficacy Verification Trial of Corn Hybrids	Syngenta	07/13/11
Expressing Event MIR162 against lepidoteran insect		
pests.		
15. Field Efficacy Verification Trial of Corn Hybrids	Syngenta	07/13/11
Expressing Event Bt11 x MIR 162 x GA21 against		
lepidopteran insect pests and glyphosate herbicide.		
16. Multi-location Field Trial of Beta Carotene	Philippine Rice	02/16/12
Enriched 'Golden Rice' event GR2-R in the Philippines.	Research Institute	
17. Multi-Location Field Test of Transgenic Cotton		
Gossypium hirsutum L., Varieties with the Bt fusion	Cotton Development	03/16/12
gene *cry 1Ab-Ac (GFM cry 1A*) against Cotton Bollworm	Administration	
(*Helicoverpa armigera Hubn.*)		

Source: Bureau of Plant Industry

The multi-location trials of the FSBR eggplant (# 11) by the University of the Philippines at Los Banos are expected to produce the first commercialized GM crop in the country. The harvest of the last required field test took place on July 10, 2012. The results of the tests are expected to confirm the efficacy of Bt eggplant against the fruit-and-shoot borer as well as its safety in respect to non-target organisms. Bt eggplant is on track to be approved in 2013.

As eggplant is an important Philippine vegetable in terms of production area (21,299 hectares) with volume valued at PhP3.4 billion (BAS, 2008), Bt eggplant has the following potential impacts (according to the DA):

- Increase in marketable harvest by 40 percent
- Reduction in pesticide usage by as much as 48 percent
- Increase in farmer's income by PhP50,000 per hectare
- Cheaper eggplants with lower insecticide residue

Despite the potential benefits above, anti-GMO activist groups have intensified their efforts to derail Bt eggplant's commercialization (see Section V).

For Vitamin A-enriched and virus-resistant rice (aka Golden Rice # 16), the last harvest of the required field trial for this season was concluded on July 12-13, 2012. Another field test (for the wet season) will still have to be undertaken before it will be considered for commercial planting. The granting of the corresponding permit, however, does not necessarily mean commercial propagation will immediately commence. To ensure optimum results are achieved, bio-efficacy studies are still likely to be pursued.

In the Philippines, 15% of children between 6 months and 5 years old, 9.5% of pregnant women and 6.4% of lactating women are vitamin A deficient. According to the DA, the commercialization of Golden Rice will not only increase rice yields but will also address key nutritional deficiencies in the country.

The country's existing biotechnology regulations have also kept agricultural trade flowing. The following table shows U.S. agricultural exports to the Philippines that possibly were derived from modern agricultural biotechnology from 2003-2011. U.S. exports to the Philippines increased more than 265 percent from $142 million in 2003 to $527 million in 2011. Soybean-based products accounted for the majority share (67 percent) of GM product exports in 2011, followed by feeds and fodder (17 percent).

CY US Exports to the Philippines (In Thousand $)									
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Soybean Meal	56,658	75,049	119,829	123,329	189,872	243,909	317,075	325,917	315,401
Feeds & Fodders	9,224	13,690	17,899	33,265	41,715	53,026	50,376	72,286	91,802
Soybeans	41,872	51,831	48,042	25,525	26,814	26,297	24,761	30,261	35,571
Sweeteners	10,071	7,400	5,431	9,842	11,492	15,751	11,287	41,950	55,685
Coarse Grains	148	214	14,179	192	776	802	3,922	842	818
Cotton	21,073	32,080	19,836	13,295	11,232	8,360	19,187	13,922	19,943
Vegetable Oil*	3,071	3,733	3,347	3,506	4,694	4,756	4,689	5,971	6,644
Soybean Oil	82	148	105	138	115	1,020	825	650	1,277
TOTALS	**142,199**	**184,145**	**228,668**	**209,092**	**286,710**	**353921**	**432,122**	**491,799**	**527,141**

Source: BICO

Section III. Plant Biotechnology Policy:

The Philippine agricultural biotechnology regulatory regime is embodied in the DA-AO 8. The responsible Philippine government regulatory agencies and their roles in relation to Philippine biotechnology regulations remain unchanged as reported in the previous annual reports. The BPI continues to be the lead-agency in implementing the science-based DA-AO 8. Under the current regulations, 32 TEs have been approved for food, feed or processing materials (see Annex I), marginally higher than the 31 approved TEs posted in the previous annual report. In addition, there were 28 approved stacked trait products as of June 7, 2012, slightly higher than the 27 approved products cited in the previous annual report. A summary of approved stacked or combined trait products is provided in Annex II.

On May 8, 2012, the DA issued Memorandum Circular No. 3 (MO 3) or the New Directive on Insect Resistance Management (IRM) in Bt Corn (Attached). Effective September 1, 2012,
MO 3 implements the bag-in-a-bag structured refuge strategy by requiring all technology developers and seed developers to package 20 percent non-Bt Corn seeds inside the larger Bt Corn seed bag.

The Philippine DA held sector consultations on proposed low level presence (LLP) guidelines in late 2011. Stakeholders expressed opposition to some provisions which would have required documentation they considered burdensome and unnecessary. Specifically, concerns were raised on the documentation requirements needed to obtain a Certificate of Safety and a proposed 4 percent non-commercial percentage as an LLP threshold of GM material in shipments. The DA agreed to revise the draft in consideration of the points raised from local stakeholders (the forthcoming revised draft will also likely include points raised at the March 2012 meeting in Vancouver, Canada on Low Level Presence).

GM labeling bills have consistently been filed in the Philippine Congress starting in 2003, or shortly after the time DA AO 8 was approved. In October 2011, the Committee on Trade and Industry of the Philippine House of Representatives conducted hearings to finalize the crafting of a substitute bill that would consolidate several labeling-related measures. The resulting substitute bill (aka the GM labeling bill) calls for the labeling of all food products derived from GM materials, including highly processed foods (where the GM protein can no longer be detected by lab testing) and even poultry and livestock where the live animals may have been fed GM feed. Many industry analysts do not expect the bill to prosper.

Section IV. Plant Biotechnology Marketing Issues:

The overall support on the responsible use of modern agricultural biotechnology remains strong although there are pockets of resistance. Some local governments continue to maintain resolutions/statements that restrict GM crop testing and/or cultivation (see Section V). This is particularly the case with GM corn. Many farmer groups in these regions, however, want better access to GM seeds. Biotechnology outreach programs initiated by the private sector, seek to overturn these prohibitions.

Section V. Plant Biotechnology Capacity Building and Outreach:

The Philippines continues to be looked upon for guidance on biotechnology policy and regulations by other developing counties. The country has likewise been a venue for GM technology-related international events. Filipino scientists are also often invited to participate as resource speakers in international biotechnology forums abroad.

Supported by funding from the USDA's Emerging Market Program (EMP), the DA-BPI held a symposium/workshop on "New Developments of GM Crop Farming" on April 3-4, 2012. The symposium coincided with the 10 year anniversary of the Philippines Biotechnology Regulatory System. In attendance during both days were over 170 regulators, scientists, researchers, policy decision-makers, technology developers, seed companies, and academia. By increasing Filipino regulators' ability to assess emerging biotech traits, this type of workshop places the Philippines in a better position to strengthen its role as a regional leader in food security and climate change adaptation.

On April 26, 2012, an international anti-GMO group and a number of Filipino artists and environmentalists petitioned the Philippine Supreme Court to halt testing of Bt eggplant nationwide. Pro-biotechnology NGOs, academics, and the DA worked to compile a response to this request. The Supreme Court has yet to rule on the petition.

Several contacts in the agricultural sector characterized the latest anti-GMO activism as an act of desperation, noting that if GM eggplant and Golden Rice achieve commercialization, the widespread economic and health benefits of these crops' would likely render anti-GMO activities moot. Others from the academe welcomed the activism as it provides the opportunity and venue for them to speak out and be heard on the benefits of Bt eggplant.

From May 21-25, 2012, supported by the Department of State's Bureau of Economic and Business Affairs, Jefferson Science Fellow and Cornell University professor Peter Davies spoke at 5 events in 3 provinces, met with key public and private sector decision makers, and helped proponents of GM crops maintain the initiative in the Philippine biotechnology debate. In Oriental Mindoro, where a provincial ban on GMOs is in place, Embassy Manila partnered with the National Corn Competitiveness Board, a multinational seed company, and a major Philippines agricultural cooperative to organize a biotechnology symposium for local farmers.

In addition to Dr. Davies, the event featured speakers from the DA-BPI who explained the Philippines' stringent biotechnology regulatory system, an overseas worker-turned farmer who attributed her escape from poverty to biotech corn, and a representative from an agricultural cooperative who said the coop. would purchase higher-quality GM corn at higher prices if the provincial ban was lifted.

Farmer after farmer asked speakers where they could obtain GM corn seeds, while others wanted to know why the seeds were so expensive. Further discussion revealed that while the farmers were painfully aware of the consequences of the provincial ban on biotech crops -- overpriced and difficult to obtain inputs -- most had no idea there was a ban in place.

Section VI. Animal Biotechnology:

There are currently no ongoing research and development projects on transgenic animals. The responsible GPH agency for animal biotechnology is the Philippine Carabao (water buffalo) Center, an attached agency of the DA.

Section VII. Author Defined:

ANNEX I - APPROVAL REGISTRY FOR THE IMPORTATION OF REGULATED ARTICLES FOR DIRECT USE AS FOOD, FEED & FOR PROPAGATION

As of June 7, 2012

Transformation Event	Introduced Trait and Gene	Date Approved	Safety Assessment Food	Feed	Propagation	Technology Developer
1. Corn MIR604	Contains modified cry3A *(mCry3A)* from *Bacillus thuringiensis* subsp. *tenebriones* which confers resistance to corn rootworm	10/08/07	x	x		Syngenta
2. Soybean MON 89788	Contains *cp4epsps* coding sequence from *Agrobacterium sp S*train, CP4 which confers resistance tolerance to Roundup family of agricultural herbicides	11/16/07	x	x		Monsanto
3. Corn MON 810	Contains cry1A(b) gene from *Bacillus Thuringiensis* var. *kurstaki* which confers resistance to corn borer	* 12/03/07	x	x	x	Monsanto
4. Corn 3272	Expresses a synthetic thermostable alpha amylase protein AMY797E that catalyzes the hydrolysis of starch into soluble sugars	02/07/08	x	x		Syngenta
5. Corn Bt 11	Contains the *cr1Ab* gene from *Bacillus thuringiensis* and *pat gene* from *Streptomyces viridochromogenes* which confer resistance to corn borer tolerance to herbicide,	* 07/22/08 & * 4/23/10 for propagation	x	x	x	Syngenta

	respectively					
6. Soybean 40-3-2	Contains *cp4epsps* coding sequence from *Agrobacterium* sp. Strain, CP4 which confers resistance tolerance to Roundup family of agricultural herbicides	* 7/22/08	x	x		Monsanto
7. Corn NK 603	Contains *cp4epsps* coding sequence from *Agrobacterium* sp. CP4 strain which confers resistance tolerance to Roundup family of agricultural herbicides	* 09/10/08 & * 3/16/10 for propagati on	x	x	x	Monsanto
8. Corn MON 863	Contains cry3Bb1 gene from *Bacillus Thuringiensis* subsp *kumamotoensis* which contains resistance to the corn root worm	* 10/07/08	x	x		Monsanto
9. Corn 1507	Contains *cry1F Bacillus thuringiensis (Bt)* var. *aizawai,* and PAT proteins which confer resistance to certain lepidopteran pests such as the Asian corn borer and pin borer (Sesamia spp)	* 10/07/08	x	x		Pioneer Hi-Bred
10. Corn DBT 418	Contains *cry1Ac* gene from *Bacillus thuringiensis* subsp *kurstaki and the bar* gene *from Streptomyces hygroscopicus* that confers resistance to	* 10/22/08	x	x		Monsanto

	lepidopteran insects and tolerance to herbicide phosphinotricin respectively					
11. Canola RT 73	Contains *cp4epsps* coding sequence from *Agrobacterium* sp. CP4 strain and the GOXv247 coding sequence from *Ochrobactrum anthropi* strain LBAA that confers tolerance to the Roundup family of agricultural herbicides	* 10/22/08	x	x		Monsanto
12. Corn BT 176	Contains cry1Ab gene from *Bacillus thuringiensis var kurstaki* which confers resistance to lepidopteran insect pest and bar gene from *Streptomyces hygroscopicus,* which produces an enzyme, phosphinothrici n acetyl transferase (PAT)	* 10/24/08	x	x		Syngenta
13. Corn GA 21	Modified *epsps* gene from corn which confers tolerance to herbicides	* 11/20/08 & 11/24/09 for propagati on	x	x	x	Monsanto
14. Corn DLL25	Contains the bar gene from bacterium, *Streptomyces hygroscopicus* that confers tolerance to herbicide phosphinotricin	* 11/20/08	x	x		Monsanto
15. Corn T25	Contains *pat* gene for *Streptomyces*	* 12/05/08	x	x		Bayer Crop Science

	viridochromogenes which encodes for tolerance to herbicide , phosphinotricin					
16. Cotton 1445	Contains *cp4epsps* coding sequence from *Agrobacterium* sp strain, CP4 which confers tolerance to the Roundup family of agricultural herbicides	* 12/05/08	x	x		Monsanto
17. Cotton 15985	Contains the *cry2Ab2* and *cry1Ac* genes which encode proteins that convey protection from lepidopteran insect pests	* 12/05/08	x	x		Monsanto
18. Potato Bt6 (RBBT02-06) and SPBT02-05	Contains *cry IA* coding sequence from *Bacillus thuringiensis* subsp *lenebriones* for tolerance to Colorado potato beetle	* 12/05/08	x	x		Monsanto
19. Potato RBMT 15-101, SEMT 15-02 and SEMT 15-15	Contains *cry IA* coding sequence from *Bacillus thuringiensis* subsp *lenebriones* strain B1256-82, which confers resistance to Colorado potato beetle and the PVY coat protein (PVYcp) isolated from PVY infected potatoes which confers resistance to the potato virus Y (PVY)	* 12/22/08	x	x		Monsanto
20. Soybean A2704-12	Contains *pat* gene which confers	01/23/09	x	x		Bayer CropScience

	tolerance to glufosinate ammonium herbicide					
21. Cotton 531	Contains *cry1Ac gene from Bacillus thuringiensis var. kurstaki* which confers resistance to lepidopterous pests	* 02/05/09	x	x		Monsanto
22. Corn MON89034	Contains two genes *(cry1A.105 and cry2Ab2)* from *Bacillus thuringiensis* which protects the plant from Asiatic corn borer, common cutworm and corn earworm	4/29/2009 & 11/19/10 for propagati on	x	x	x	Monsanto
23. Potato RBMT21-129, RBMT21-350 and RBMT 22-82	Resistance to Colorado potato beetle - *CryIIIA* coding sequence, Resistance to potato leaf roll virus (PLRV) - PLRV replicase	* 10/16/09	x	x		Monsanto
24. Soybean DP356043	Contains the *gat4601* gene derived from *Bacillus licheniformis* conferring tolerance to glyphosate and ALS (acetolactate synthase) inhibiting herbicides	11/26/09	x	x		Pioneer Hi-Bred
25. Corn MIR162	Contains two novel genes: *vip3Aa20* gene from *Bacillus thuringiensis* resistance to lepidopteran pests and *pmi* gene from *Escherichia coli* encoding the enzyme phosphomanno se isomerase	02/11/10	x	x		Syngenta

	present as a selectable marker					
26. Sugar beet H7-1	Contains *cp4epsps* coding sequence from *Agrobacterium sp.* CP4 strain, CP4 which confers tolerance to glyphosate	* 7/28/10	x	x		Monsanto
27. Soybean CV127	Contains gene csr-2 from *Arabidopsis thaliana* which encodes the imidazoline herbicide tolerant acetohydroxyacid synthase (AtAHAS)	10/29/10	x	x		BASF
28. Cotton MON 88913	Cotton contains the *cp4epsps* coding sequence from *Agrobacterium sp*. Strain, CP4 which confers tolerance to the Roundup family of herbicides	* 11/26/2010	x	x		Monsanto
29. Corn MON 88017	Contains *cry3Bb1* gene from *Bacillus thuringiensis* subsp. *Kumamotoensis*, which confers resistance to the corn rootworm, *Diabrotica spp* and *cp4epsps* gene from *Agrobacterium sp.*, which encodes tolerance to glyphosate resistance	* 3/21/2011	x	x		Monsanto
30. Soybean A5547-127	Contains a synthetic phosphinothricin acetyltransferase (pat gene) from *Streptomyces*	* 6/23/2011	x	x		Bayer Crop Science

	viridochromogenes expressing tolerance to glufosinate ammonium herbicide					
31. Alfalfa J101 and J163	Contains *cp4epsps* coding sequence from *Agrobacterium sp.* Strain, CP4 which confers tolerance to the Roundup family of agricultural herbicides	* 8/9/2011	x	x		Monsanto
32. Corn 59122	Contains *cry34Ab1* and *cry35Ab1* from *Bacillus thuringiensis* which confers resistance to certain coleopteran pests such as corn rootworm, *Diabrotica sp*. And the *pat* gene from *Streptomyces viridochromogenes* which provides tolerance to glufosinate-ammonium herbicides	* 8/9/2011	x	x		Pioneer Hi-Bred and Dow Agro Sciences

*Renewal

Source: Bureau of Plant Industry

ANNEX II - APPROVAL REGISTRY FOR THE REGISTRATIONM OF COMBINED TRAIT PRODUCTS FOR DIRECT USE AS FOOD, FEED & FOR PROPAGATION As of June 7, 2012					
As of June 7, 2012			**Safety Assessment**		
Combined Trait Product	**Technology Developer**	**Date Approved**	**Food**	**Feed**	**Propagation**
1. Corn Bt11 x Corn MIR 604	Syngenta	12/13/07	x	x	
2. Corn MIR 604 x Corn GA21	Syngenta	12/13/07	x	x	
3. Corn Bt11 x Corn MIR 604 x GA21	Syngenta	03/03/08	x	x	
4. Corn MON89034 x Corn NK603	Monsanto	07/22/09	x	x	x

					* 03/04/11
5. Corn MON89034 x Corn MON88017	Monsanto	10/19/09	x	x	
6. Corn MON810 x Corn NK603	Monsanto	* 01/8/10	x	x	x * 07/16/10
7. Corn MON810 x Corn MON863	Monsanto	* 01/8/10	x	x	
8. Corn NK603 x Corn MON863	Monsanto	* 01/8/10	x	x	
9. Cotton 531 x Cotton 1445	Monsanto	* 01/8/10	x	x	
10. Cotton 15985 x Cotton 1445	Monsanto	* 01/8/10	x	x	
12. Corn MON810 x GA21	Monsanto	* 02/8/10	x	x	
13. Corn MON89034 x Corn 1507 x Corn 88017 x Corn 59122	Monsanto	02/09/10	x	x	
14. Corn NK603 x Corn T25	Monsanto	04/22/10	x	x	
15. Corn Bt11 x Corn MIR 162 x GA21	Syngenta	07/28/10	x	x	
16. Corn 3272 x Corn Bt11 x Corn MIR604 x Corn GA21	Syngenta	07/28/10	x	x	
17. Corn Bt11 x Corn MIR612 x Corn MIR604 x Corn GA21	Syngenta	12/10/10	x	x	
18. Corn MON89034 x Corn TC1507 x Corn NK603	Dow Agro Sciences & Monsanto	12/10/10	x	x	
19. Corn Bt11 x Corn MIR612 x Corn TC1507 x Corn GA21	Syngenta	12/22/10	x	x	
20. Corn TC1507 x Corn NK603	Pioneer Hi-Bred & Dow Agro Sciences	* 02/17/11	x	x	
21. Cotton 15985 x RR Flex Cotton (MON 88913)	Monsanto	* 04/20/11	x	x	
22. Corn MON88017 x Corn MON810	Monsanto	* 07/01/11	x	x	
23. Corn BT11 x Corn DAS59122 x Corn MIR604 x Corn TC1507 x Corn GA21	Syngenta	09/03/11	x	x	
24. Corn Bt 11 x Corn GA21	Syngenta	* 01/23/12	x	x	x * 09/06/10
25. Corn 59122 x Corn NK603	Pioneer Hi-Bred & Dow Agro Sciences	* 02/07/12	x	x	
26. Corn TC1507 x Corn 5912	Pioneer Hi-Bred & Dow Agro Sciences	* 02/07/12	x	x	
27. Corn 59122 X Corn TC1507 x Corn NK603	Pioneer Hi-Bred & Dow Agro Sciences	* 02/07/12	x	x	
28. Corn TC1507 x Corn MON810 x Corn NK603	Pioneer Hi-Bred	03/16/12	x	x	

*Renewal

Source: Bureau of Plant Industry